PART I: EXECUTIVE SUMMARY/OVERVIEW

Summary of Louisiana's Water Quality Assessment Program

Louisiana, well known for its abundance of water resources, contains over 66,294 miles of rivers and streams, 1,078,031 acres (1,684 square miles) of lakes and reservoirs, 5,882,070 acres (9,191 square miles) of fresh and tidal wetlands, and 4,899,840 acres (7,656 square miles) of estuaries. These figures, some of which are taken from the U.S. Environmental Protection Agency's (U.S. EPA) River Reach 3 file, are believed to be low in comparison to the actual total area of Louisiana's rivers, lakes, wetlands, and estuaries. It is the responsibility of the Louisiana Department of Environmental Quality (LDEQ) to protect the chemical, physical, biological and aesthetic integrity of the water resources and aquatic environment of Louisiana. This responsibility is undertaken through the use of public education, scientific endeavors, water quality management and regulatory enforcement, in order to provide the citizens of Louisiana with clean and healthy water now and in the future.

The *2004 Integrated Report* documents LDEQ's progress toward meeting this responsibility. Louisiana's *Integrated Report* is produced, in part, to meet requirements of the Federal Water Pollution Control Act commonly known as the Clean Water Act (CWA) (CWA, 1972). The primary CWA sections addressed by the *2004 Integrated Report* are §303(d) and §305(b). Section 303(d) represents Louisiana's list of impaired water bodies requiring development of a Total Maximum Daily Load (TMDL). Section 305(b) of the CWA requires each state to provide the following information to the Administrator of the U.S. EPA:

1. A description of the water quality of all navigable waters in the state;
2. An assessment of the status of waters of the state with regard to their support of recreational activities and fish and wildlife propagation;
3. An assessment of the state's water pollution control activities toward achieving the CWA goal of having water bodies that support recreational activities and fish and wildlife propagation;
4. An estimate of the costs and benefits of implementing the CWA; and
5. A description of the nature and extent of nonpoint sources of pollution and recommendations for programs to address nonpoint source pollution.

For the *2004 Integrated Report* LDEQ used U.S. EPA's *Consolidated Assessment and Listing Methodology* (U.S. EPA, 2002), which contains the Integrated Report (IR) guidance, as well U.S. EPA's guidance document, *Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates* (U.S. EPA, 1997). Louisiana's water quality regulations (ERC, 2003) were used to determine water quality uses and criteria and, in some cases, assessment procedures. Beginning with the *2002 Water Quality Inventory,* use of IR guidance changed several aspects of LDEQ's water quality assessment procedures. One of the primary focuses of IR guidance was on the use of seven categories to which water bodies or water body/impairment combinations could be assigned. Categorization under IR guidance allows for a more focused approach to water quality management by clearly determining what actions are required to protect or improve individual waters of the state. The seven IR categories can be found in Table 1.1.1. Other changes resulting from U.S. EPA's IR guidance can be found in the *2002 Water Quality Inventory*, Executive Summary.

The 2004 *Integrated Report* is the first such report to be produced following complete sampling of all twelve of Louisiana's major watershed management basins. As of December 2002, Louisiana completed the final round of its five-year rotating basins ambient water quality monitoring program. Under this program, nearly every water body management subsegment in Louisiana (A total of 479 subsegments.) was monitored once per month for a full year. This represents a significant increase in the number of ambient water quality monitoring sites located in the state. With this improved monitoring, accurate water quality data is now available for approximately 400 additional water bodies that Louisiana has, in the past, not been able to sample as part of its ambient water quality monitoring program.

Table 1.1.1

U.S. Environmental Protection Agency Integrated Report (IR) guidance categories used to categorize water body/impairment combinations for Louisiana's *2004 Integrated Report.*

IR Category	IR Category Description
Category 1	Specific water body impairment combination (WIC) cited on a previous §303(d) list that is now attaining all designated uses and standards.
Category 2	Water body is meeting some uses and standards but there is insufficient data to determine if designated uses and standards *associated with the specific WIC* cited are being attained.
Category 3	There is insufficient data to determine if designated uses and standards *associated with the specific WIC* cited are being attained.
Category 4a	WIC exists but a TMDL has been completed for the *specific WIC* cited.
Category 4b	WIC exists but control measures other than a TMDL are expected to result in attainment of designated uses and standards *associated with the specific WIC* cited.
Category 4c	WIC exists but a pollutant does not cause the *specific WIC* cited.
Category 5	WIC exists for one or more designated uses, and a TMDL is required for the *specific WIC* cited. *This represents Louisiana's §303(d) List*.

As a result of the use of IR guidance, and the improved ambient water quality monitoring program, the *2004 Integrated Report* is the most accurate and comprehensive §305(b) report ever produced by Louisiana. Through the use of water quality data collected over the past one to five years, which includes data collected from many water bodies for the first time, LDEQ is now able to develop a more accurate picture of water quality in Louisiana.

Summary of Overall Water Quality in Louisiana

While many challenges remain, water quality in Louisiana has improved considerably in the years since passage of the Federal Clean Water Act of 1972 and Louisiana's Environmental Quality Act of 1983. LDEQ recognizes three primary designated uses for most waters of the state. These are primary contact recreation (swimming), secondary contact recreation (boating), and fish and wildlife propagation (fishing). Table 1.1.2 shows the overall support for these three designated use for *all Louisiana water body types, combined*.

Table 1.1.2

Summary of designated use support for all water body types, combined. *2004 Integrated Report.*

Designated Use	Fully Supported	Not Supported	Insufficient Data	Total subsegments with a given use
Primary Contact Recreation	336 (72.6%)	111 (23.9%)	16 (3.5%)	463
Secondary Contact Recreation	427 (89.1%)	30 (6.3%)	22 (4.6%)	479
Fish and Wildlife Propagation	150 (31.0%)	318 (65.7%)	16 (3.3%)	484

As shown in Table 1.1.2, a large percentage of Louisiana water bodies are fully supporting their designated uses of primary and secondary contact recreation. These two uses are assessed primarily by the density, or concentration, of fecal coliform bacteria. Fecal coliform are used an indicator of possible contamination by sewage, livestock manure, or even wildlife. If fecal coliform are present in high densities, there is a higher probability that pathogenic, or harmful, organisms could be present. Fortunately, due to the efforts of LDEQ, the Louisiana Department of Health and Hospitals (LDHH), and local Parish government these

sources of fecal coliform are being addressed throughout Louisiana. LDEQ works to regulate the discharge of water from municipal sewage treatment plants and small package plants used by communities and businesses. LDEQ also administers a loan program to assist communities in building or upgrading their sewage treatment plants. Finally, LDEQ's Nonpoint Source Program works on ways to encourage homeowners to properly utilize their home sewage treatment systems. At the same time, LDHH and local Parish governments work to improve and enforce regulations for home sewage systems. As can be seen by the high percentage of water bodies meeting the designated uses of primary and secondary contact recreation, these programs are having a positive effect on Louisiana's water quality.

Unfortunately, many of Louisiana's water bodies remain impaired for the designated use of fish and wildlife propagation. This is largely due to the fact there are so many possible causes and sources of impairment impacting this use. Any one of these causes can result in a water body being considered impaired for fish and wildlife propagation. As shown in Table 1.1.3, there are over thirty different suspected causes of impairment reported as impacting fish and wildlife propagation. With the exception of mercury, all of the top eight suspected causes of impairment can generally be related to what is known as nonpoint sources of pollution. Nonpoint source pollution consists of those forms of pollution caused by the runoff of stormwater from agricultural fields, forestry areas, construction sites, and urban areas, to name a few. The remaining causes of impairment are generally related to various forms of industry, small business, or municipal sources. However, a variety of pesticides from agriculture also occur to a lesser extent.

The large number of impairments related to mercury is due to the presence of thirty fish consumption advisories related to mercury, each of which might impact one or more distinct water bodies in a region. Because the sources of mercury are to a large extent national in scope, EPA has taken the lead in developing ways to address mercury releases to the environment. However, LDEQ is participating in this effort, and has an extensive fish tissue monitoring program to identify areas where mercury is a concern.

It is apparent there are a large number of problems facing Louisiana's fish and wildlife propagation use. Fortunately, LDEQ has numerous programs in place to address these problems. Programs include permitting of industry, smaller businesses, and municipalities; enforcement and remediation actions to identify and correct problems when they occur; and the development and implementation of best management practices to address nonpoint sources of pollution. More information on Louisiana's water pollution control efforts can be found in Part II, Chapter 2. And more information on the suspected causes and sources of water pollution in Louisiana can be found in Part III, Chapters 3-6.

Table 1.1.3

Number of water body subsegments, with the designated use of fish and wildlife propagation, impacted by each suspected cause of impairment. Subsegment counts are broken down by water body type. ***2004 Integrated Report.***

	Water Body Type				
Suspected Causes of Impairment	**River**	**Lake**	**Estuary**	**Wetland**	**Grand Total**
Oxygen, Dissolved	152	22	6	2	182
Mercury	66	15	9	2	92
Nitrate/Nitrite (Nitrite + Nitrate as N)	75	12	5		92
Total Phosphorus	71	12	5		88
Turbidity	63	13	5		81
Total Dissolved Solids	58	8		1	67
Total Suspended Solids (TSS)	58	7	2		67
Sedimentation/Siltation	39	6	2		47
Sulfates	40	5		1	46
Non-Native Aquatic Plants	27	16	1		44
Chloride	36	6		1	43

Table 1.1.3

Number of water body subsegments, with the designated use of fish and wildlife propagation, impacted by each suspected cause of impairment. Subsegment counts are broken down by water body type. ***2004 Integrated Report.***

Suspected Causes of Impairment	Water Body Type				Grand Total
	River	Lake	Estuary	Wetland	
Carbofuran	24	1	1		26
pH	16	3			19
Lead	11	3			14
Nitrogen, ammonia (Total Ammonia)	8	2	1		11
DDT	6				6
Polychlorinated biphenyls	3	3			6
Fipronil	5				5
Oil and Grease	2	2	1		5
Atrazine	4				4
Copper	2	1			3
Dioxin (including 2,3,7,8-TCDD)	3				3
Cadmium	1	1			2
Hexachlorobenzene	1	1			2
Hexachlorobutadiene	1	1			2
Polycyclic Aromatic Hydrocarbons (PAHs) (Aquatic Ecosystems)	2				2
Temperature, water	1	1			2
Toxaphene	2				2
1,1,1,2-Tetrachloroethane	1				1
1,2-Dichloroethane	1				1
Bromoform	1				1
Methoxychlor	1				1
Methyl Parathion	1				1
Phenols	1				1
Grand Total	**783**	**141**	**38**	**7**	**969**

Summary of River Quality in Louisiana

Figures 1.1.1 through 1.1.3 summarize support of the three most common designated uses for Louisiana rivers. The uses are primary contact recreation (PCR) (swimming), secondary contact recreation (SCR) (boating), and fish and wildlife propagation (FWP). These three uses address the primary directive of the Clean Water Act, to make the waters of the United States both "fishable and swimmable." Other uses are established for selected water bodies in Louisiana. The status of these uses can be found in Part III, Chapters 3-6.

Figure 1.1.1. Support for primary contact recreation (swimming) for Louisiana rivers, *2004 Integrated Report.* (Based on 340 assessed rivers.)

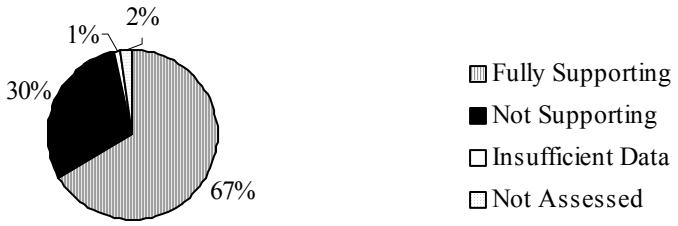


Figure 1.1.2. Support for secondary contact recreation (boating) for Louisiana rivers, *2004 Integrated Report.* (Based on 352 assessed rivers.)

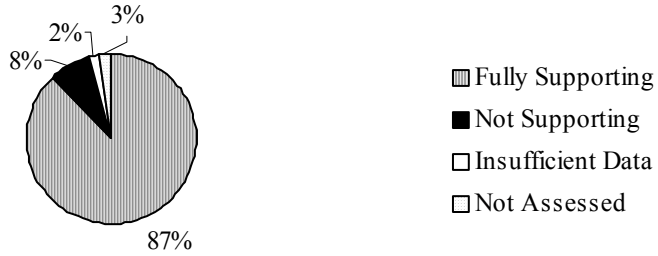
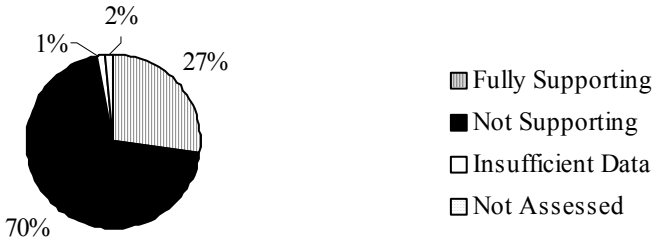


Figure 1.1.3. Support for fish and wildlife propagation (fishing) for Louisiana rivers, *2004 Integrated Report*. (Based on 354 assessed rivers.)



The most frequently identified suspected impairments found in Louisiana rivers include: low dissolved oxygen (4,143 miles); fecal coliforms (3,265 miles); nitrate/nitrite (2,484 miles); turbidity (2,208 miles); total phosphorus (2,127 miles); total suspended solids (2,067 miles); mercury (1,600 miles); total dissolved solids (1,338 miles); and sedimentation/siltation (1,313 miles). The most frequently cited suspected sources

of impairment include: unknown sources (3,947 miles); natural conditions[1] (2,319 miles); irrigated crop production (2,192 miles); non-irrigated crop production (1,834 miles); septic systems (1,707 miles); atmospheric deposition (1,385 miles); and municipal sewage discharges (708 miles).

Summary of Lake Quality in Louisiana

Figures 1.1.4 through 1.1.6 summarize support of primary contact recreation (PCR) (swimming), secondary contact recreation (SCR) (boating), and fish and wildlife propagation (FWP). Other uses are established for selected water bodies in Louisiana. The status of these uses can be found in Part III, Chapters 3-6.

Figure 1.1.4. Support for primary contact recreation (swimming) for Louisiana lakes, *2004 Integrated Report*. (Based on 65 assessed lakes.)

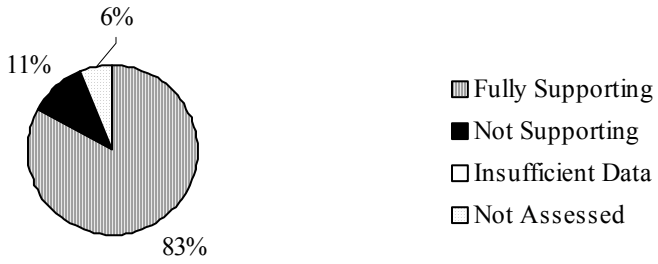
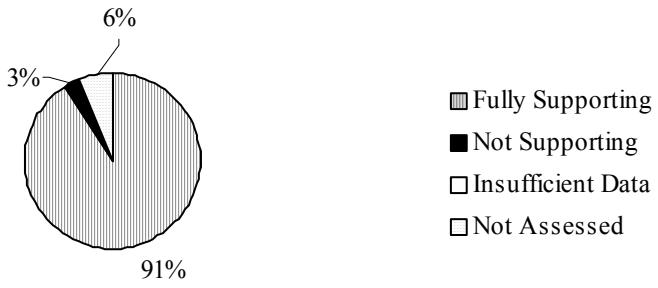
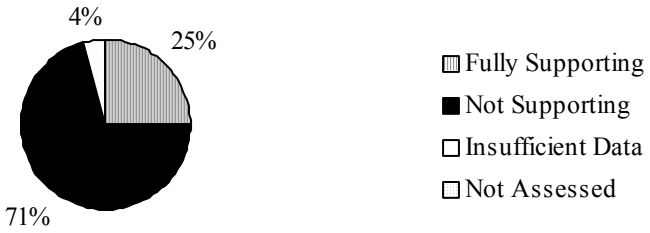


Figure 1.1.5. Support for secondary contact recreation (boating) for Louisiana lakes, *2004 Integrated Report*. (Based on 65 assessed lakes.)



1 Natural conditions consists of "Natural Conditions-Water Quality Standards Use Attainability Analyses Needed" and "Natural Sources."

Figure 1.1.6. Support for fish and wildlife propagation (fishing) for Louisiana lakes, *2004 Integrated Report*. (Based on 68 assessed lakes.)



The most frequently identified suspected impairments found in Louisiana lakes include: non-native aquatic plants (319,163 acres); mercury (reported primarily due to fish consumption advisories) (256,449 acres); turbidity (189,824 acres); low dissolved oxygen (178,593 acres); sedimentation/siltation (164,346 acres); total suspended solids (156,343 acres); total dissolved solids (136,212 acres); chlorides (132,839 acres); and nitrate/nitrite and total phosphorus (126,032 acres). The most frequently cited suspected sources of impairment include: unknown sources (410,166 acres); atmospheric deposition (246,939 acres); natural conditions (144,616 acres); non-irrigated crop production (101,460 acres); irrigated crop production (84,048 acres); and drought related impacts (74,900 acres).

Summary of Estuary Quality in Louisiana

Figures 1.1.7 through 1.1.9 summarize support of primary contact recreation (PCR) (swimming), secondary contact recreation (SCR) (boating), and fish and wildlife propagation (FWP). Other uses are established for selected water bodies in Louisiana. The status of these uses can be found in Part III, Chapters 3-6.

Figure 1.1.7. Support for primary contact recreation (swimming) for Louisiana estuaries, *2004 Integrated Report*. (Based on 52 assessed estuaries.)

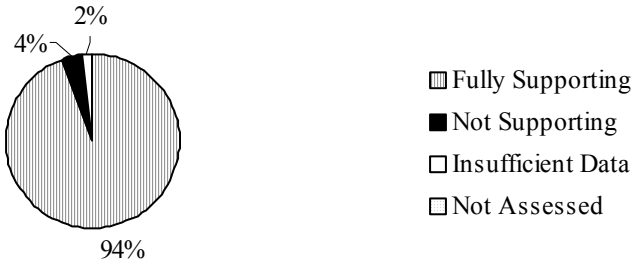


Figure 1.1.8. Support for secondary contact recreation (boating) for Louisiana estuaries, *2004 Integrated Report*. (Based on 52 assessed estuaries.)

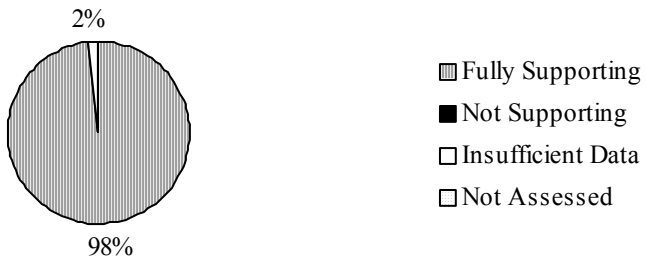
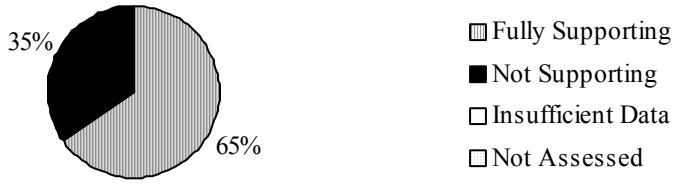


Figure 1.1.9. Support for fish and wildlife propagation (fishing) for Louisiana estuaries, *2004 Integrated Report*. (Based on 52 assessed estuaries.)



The most frequently identified suspected impairments found in Louisiana estuaries include: mercury (reported primarily due to fish consumption advisories) (1,657 square miles); fecal coliforms (1,613 square miles); turbidity (624 square miles); low dissolved oxygen (299 square miles); and nitrate/nitrite and total phosphorus (297 square miles). The most frequently cited suspected sources of impairment include: unknown sources (2,179 square miles); atmospheric deposition (1,657 square miles); and irrigated and non-irrigated crop production (193 square miles).

Summary of Wetland Quality in Louisiana

Figures 1.1.10 through 1.1.12 summarize support of primary contact recreation (PCR) (swimming), secondary contact recreation (SCR) (boating), and fish and wildlife propagation (FWP). Other uses are established for selected water bodies in Louisiana. The status of these uses can be found in Part III, Chapters 3-6.

Figure 1.1.10. Support for primary contact recreation (swimming) for Louisiana wetlands, *2004 Integrated Report*. (Based on 6 assessed wetlands.)

Figure 1.1.11. Support of secondary contact recreation (boating) for Louisiana wetlands, *2004 Integrated Report*. (Based on 10 assessed wetlands.)

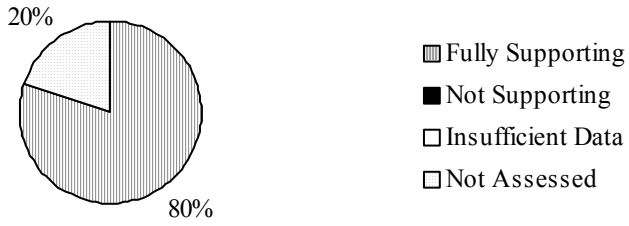
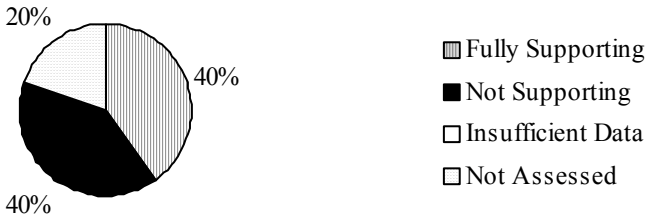


Figure 1.1.12. Support for fish and wildlife propagation (fishing) for Louisiana wetlands, *2004 Integrated Report*. (Based on 10 assessed wetlands.)



The most frequently identified suspected impairments found in Louisiana wetlands include: mercury (reported primarily due to fish consumption advisories) (394,880 acres); and low dissolved oxygen (282,240 acres). The most frequently cited suspected sources of impairment include: unknown sources and

atmospheric deposition (394,880 acres); non-irrigated crop production (282,240 acres); petroleum/natural gas production activities (195,840 acres); and natural conditions (86,400 acres).

When looked at across all water body types a pattern of both suspected causes and sources of impairment emerges. The most frequently cited suspected causes of impairment for all water bodies combined are fecal coliforms primarily from septic tanks and municipal sewage systems; low dissolved oxygen from sewage, agriculture, or natural causes; sediment related problems such as turbidity, suspended solids, and siltation caused by agriculture or natural cause; and mercury related to fish consumption advisories due primarily to atmospheric deposition of mercury on the watershed. Many of the suspected sources of water quality impairment are known collectively as nonpoint source pollution. Nonpoint source pollution is discussed in detail in Part II, Chapter 2.

Ground Water Quality

The Environmental Evaluation Division's Baseline Monitoring Project provides water quality data from fresh water aquifers around the state. Wells producing from a common aquifer are sampled in a narrow time frame. The smaller aquifers can be sampled in one or two days, whereas the larger aquifers may take several months to complete. At such time when all project wells of a particular aquifer have been sampled, a summary report is written.

For this report, U.S. EPA has encouraged states to select an aquifer or hydrogeologic setting and discuss available data that best reflects the quality of the resource. For 2004, the Baseline Monitoring network for the Evangeline aquifer is discussed.

Water Pollution Control Programs

LDEQ has been given the responsibility of managing the quality of Louisiana's surface waters by upgrading the quality where man's activities have caused degradation and by preserving the integrity of those waters where good quality exists. Water pollution controls employed by the agency include municipal and industrial wastewater discharge permits, enforcement of permit requirements, review and certification of projects affecting water quality, implementation of best management practices for nonpoint source pollution, and regular water quality monitoring of the state's surface waters. Toward this end, in 1997 the LDEQ was granted National Pollutant Discharge Elimination System (NPDES) delegation by the U.S. EPA. As a result of delegation most facilities that discharge to waters of the state are only required to obtain one permit, rather than both an NPDES permit and a state permit as in the past. In addition to LDEQ's permitting responsibilities, grants and loans for construction and upgrade of municipal treatment facilities are awarded through the LDEQ. In the past, the majority of pollution control programs have been directed at point source discharges through the issuance of wastewater permits, compliance assurance activities, and enforcement activities. While this is still the case, nonpoint source pollution control efforts continue to increase.

Presently, LDEQ does not regulate most nonpoint sources through permits. LDEQ's Environmental Planning Division (EPD) currently houses the state's nonpoint source management program, which has been successful in implementing voluntary controls and education efforts. This has been done through coordination with other concerned agencies, such as the State Department of Agriculture and Forestry, the U.S. Natural Resource Conservation Service, and the Louisiana State University Cooperative Extension Service. Because studies have indicated that regulation of point source discharges alone will not guarantee maintenance of good water quality conditions in surface waters of the state, the EPD in cooperation with other participating agencies is developing nonpoint source control demonstration projects for targeted areas.